REMARKS:

The specification has been amended at pages 1 and 2 to correct minor errors and to indicate Flexten as a registered trademark. No new matter is presented.

Claims 1 and 5 have been amended to include the preferred weight percentages of the trans 1,4-polybutadiene rubber. Claims 4, 8 and 14 have been amended as suggested by the Examiner.

Claims 1-2, 4-6 and 8-14 have been rejected under 35 U.S.C. §103 as being unpatentable over U.S. Patent 5,174,838 issued to Sandstrom in view of either of European Patent 410,311, European Patent 461,329 or Japanese Publication 1-135847. This rejection is respectfully traversed.

Accompanying an earlier response filed in the parent application (Serial No. 07/945,465 filed September 16, 1992) was the signed declaration of Paul Harry Sandstrom. This was the second declaration of Mr Sandstrom that had been filed. As stated in Mr Sandstrom's second declaration, he is the same Paul Sandstrom appearing as a named inventor on the primary reference. The rubber compound used in the tread base in his patent is comprised of at least one diene rubber and a high trans 1,4-polybutadiene rubber. The tread cap rubber compound is formulated to provide good skid resistance, tread wear and rolling resistance. The tread base rubber compound is formulated to enhance rolling resistance and durability of the tire. The primary purpose for dividing a tread into an outer cap portion and an underlying base portion is to provide a tread base which will reduce the tire's overall rolling resistance. As taught in Mr. Sandstrom's patent (column 1, lines 35-42), the cap/base rubber composite may be designed to improve the rolling resistance of the tire without unduly sacrificing its traction or tread wear. However, such a desirable aspect is difficult to obtain with a single tread compound because, for example, rolling resistance reduction is typically obtained at the expense of traction and/or tread wear. Therefore, this reference clearly teaches using a different rubber compound in the tread cap and in the tread base.

It is recognized in the Examiner's Action that Sandstrom '838 does not teach the rubber composition containing trans 1,4-polybutadiene should be used in the apex region. However, the Examiner has relied on the secondary references cited above as disclosing use of rubber compositions suitable for the bead and/or apex region of the tire as well as the tread. It is concluded in the Examiner's Action that it would have been obvious of

one of ordinary skill in the art at the time of the invention to find an application of the composition of Sandstrom '838 in the bead area since it is known for compositions disclosed for use in the tread area of the tire to be suitable for use in the tire apex. This contention is respectfully traversed.

Mr Sandstrom comments on the teachings of the Abstract to EP 410311 in his second declaration at paragraph 4. This abstract teaches the use of a rubber compound of which 30 to 100 percent of the rubber consists of a hydrocarbon rubber containing nitrile groups. The Abstract discloses that the specific rubber compound may be used in at least the tread, sidewall, profile core and bead. The profiled core (7) is the apex of the tire. The Abstract goes on to teach that the bead and/or outer cores are preferably free from phenolic resin. This implies to Mr. Sandstrom that phenolic resins may be used in the tread and, therefore, the rubber compound from the tread is not identical to the rubber compound used in the apex aside from the common usage of the 30 percent to 100 percent of the hydrocarbon containing nitrile groups. Simply because one reference says a particular rubber compound may be used in an apex of a tire and in a tread does not mean that all compounds for use in a tread are acceptable for use in an apex of a tire. Not all compounds for use in a tread are equivalent nor are all compounds for use in a tread. In addition, there is no teaching in this reference that hydrocarbon rubber containing nitrile groups may be a replacement for 1,4-polybutadiene rubber or that it is equivalent in terms of properties.

During Mr. Sandstrom's 25 years of experience in the field of polymer science, he has learned that there are hundreds of recipes for rubber compounds, each of which are typically tailored to their end use in a tire. The pneumatic tire is a complex system of interacting components, each with its own properties for maximum effectiveness; yet, the performance of the tire depends on the interactions of the components. The reason for this is because each component of the tire has its own performance requirements which must be considered when formulating the rubber compound for use in the respective component. For example, when one is formulating a rubber compound for use in a tread cap, one looks for properties that include high elongation and high tear strength so the tire tread has higher rolling resistance and maximum cut growth resistance. When one is formulating a rubber compound for use in an apex, one looks for properties that include high stiffness and high modulus because the tire designer does not want the apex area to

move to avoid delamination of the tire from the rim during use. Rubber compounds with high stiffness and high modulus would necessarily have low tear strength and low elongation values. Rubber compounds for tread caps would have high tear and high elongation values.

The other secondary reference that is cited in the Examiner's Action is EP 461329. EP 461329 discloses the use of reinforced polymer blends containing micro and macrofibers in various tire components. The polymer blends are described as being useful in the tread base, tread, apex, sidewall and bead areas of tires. This reference does not disclose or suggest the use of an apex composition comprised of, based on 100 parts by weight of rubber, (a) about 80 to 97 parts by weight of at least one rubber selected from the group consisting natural rubber, synthetic cis-1,4-polyisoprene rubber and cis 1,4-polybutadiene rubber and (b) 3 to about 20 parts by weight of a trans 1,4-polybutadiene rubber having at least 65 percent trans 1,4-content. The claimed invention in the present application is not the first pneumatic tire with an apex compound. Hundreds of compounds have been tested for use in an apex. However, two essential points need to be made. First, tread base compounds are not viewed by one skilled in the art as a drop in the slot replacement for an apex compound. Second, the reinforced compounds of EP 461329 are not taught as being equivalent nor are they in the mind of Mr Sandstrom, to the compounds used in his patent 5,174,838.

The Abstract to Japanese publication 1,135,847 has also been cited by the Examiner to supplement the noted deficiencies of the Sandstrom primary reference. This abstract discloses a tire containing a butadiene polymer having 70 to 90 percent of trans 1,4-bonds. The polymer may be used for tread, sidewall, belt and bead applications. This abstract does not disclose the use of trans 1,4-polybutadiene in an apex wherein the uncured state of the polybutadiene has two melting points. The abstract also does not suggest that a tread compound may be substituted for an apex compound.

Claims 1-2, 4-6 and 8-14 have been rejected under 35 U.S.C. as being unpatentable over U.S. Patent 4,824,899 issued to Yasuda in view of U.S. Patent 5,174,838 issued to Sandstrom et al. This rejection is respectfully traversed.

U.S. Patent 4,824,899 issued to Yasuda teaches the use of 1 to 15 parts by weight of a metal salt of acrylic acid. The present invention requires from about 3 to about 20 parts by weight of a trans 1,4-polybutadiene rubber. Yasuda does not suggest or disclose

nor is Mr. Sandstrom aware of any reference that would suggest or disclose that trans 1,4-polybutadiene is equivalent to or is a known replacement for a metal salt of acrylic acid in a rubber for use in any tire. It is contended that the combination in Yasuda results in a composition substantially similar in properties to the composition of Sandstrom et al. This is not shown in the reference and Applicants respectfully repeat their request for a declaration or affidavit from the Examiner to support the Examiner's position that the compositions of Aside are substantially similar to those of Sandstrom et al. Simply because one combines a rubber with a certain additive to improve a certain property does not necessarily demonstrate that the resulting compositions have the same properties overall.

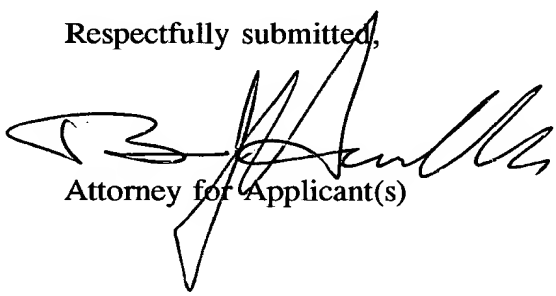
Claims 1-2, 4-6 and 8-14 have been rejected under 35 U.S.C. §103 as being unpatentable over the Abstract for Japanese publication 57-212239 in view of U.S. Patent 5,174,838 issued to Sandstrom et al. This rejection is respectfully traversed. The Abstract to the Japanese publication teaches a rubber composition for a bead filler which is comprised of (a) 100 parts by weight of rubber composed of (1) 70 to 95 parts of a solid rubber selected from natural rubber, polyisoprene rubber, polybutadiene rubber and styrene-butadiene rubber and (2) 30 to 5 parts of a liquid diene rubber having functional groups at the molecular terminals or in the molecule with (B) a masked polyisocyanate and (D) 5 to 25 parts by weight of a Novolak-type phenolic resin and/or a Novolak-type modified phenolic resin. The Examiner is citing page 2, lower left hand of the text, lines 11-20 as teaching the use of polybutadiene. Applicants have not been provided with a translation of this reference other than the English translation of the Abstract. Once again, Applicants would appreciate if such a copy would be provided if the Examiner continues to reject any claims based upon English passages of this reference other than those passages found in the Abstract. The teaching of a diene type rubber such as polybutadiene is generally meant to include cis 1,4-polybutadiene rubber. Cis 1,4-polybutadiene rubber and trans 1,4-polybutadiene are drastically different rubbers. This reference also fails to suggest or disclose that the liquid diene rubber having functional groups at the molecular terminals or in the molecule coupled with the use of a masked polyisocyanate is equivalent to or may be a drop in slot replacement for trans 1,4-polybutadiene. It is stated in the Examiner's Action that Sandstrom et al teach that trans 1,4-polybutadiene is well known for improving green strength of rubber mixtures and,

thus, would be well suited for use in the bead filler of the Japanese publication. Applicant's review of the Abstract indicates nothing is said about improving green strength. It is only the Examiner's opinion that suggests the combination and not the references themselves. It is stated in the Examiner's Action that it would have been obvious to one of ordinary skill in the art at the time of the invention to use the trans 1,4-polybutadiene of Sandstrom et al as the liquid diene rubber required by the Japanese publication 57-212239. Once again, Applicants respectfully request where such equivalence is taught in the references. Applicants contend that such a showing is not taught, disclosed or would be suggested to one of ordinary skill in the art. It is also stated in the Examiner's Action that such a combination of references results in a composition essentially similar to that of Applicants. Once again, the Examiner has simply looked at one property that is allegedly improved and concluded that all of the properties would be similar. This conclusion is not supported in the cited references standing alone or in combination.

Applicants have reviewed the references cited as of interest but submit that fail to supplement the above-noted deficiencies of the cited references.

Based upon the foregoing, Applicants respectfully request reconsideration of the rejection and consideration of the second declaration of Paul Sandstrom which accompanies this reference.

Respectfully submitted,



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